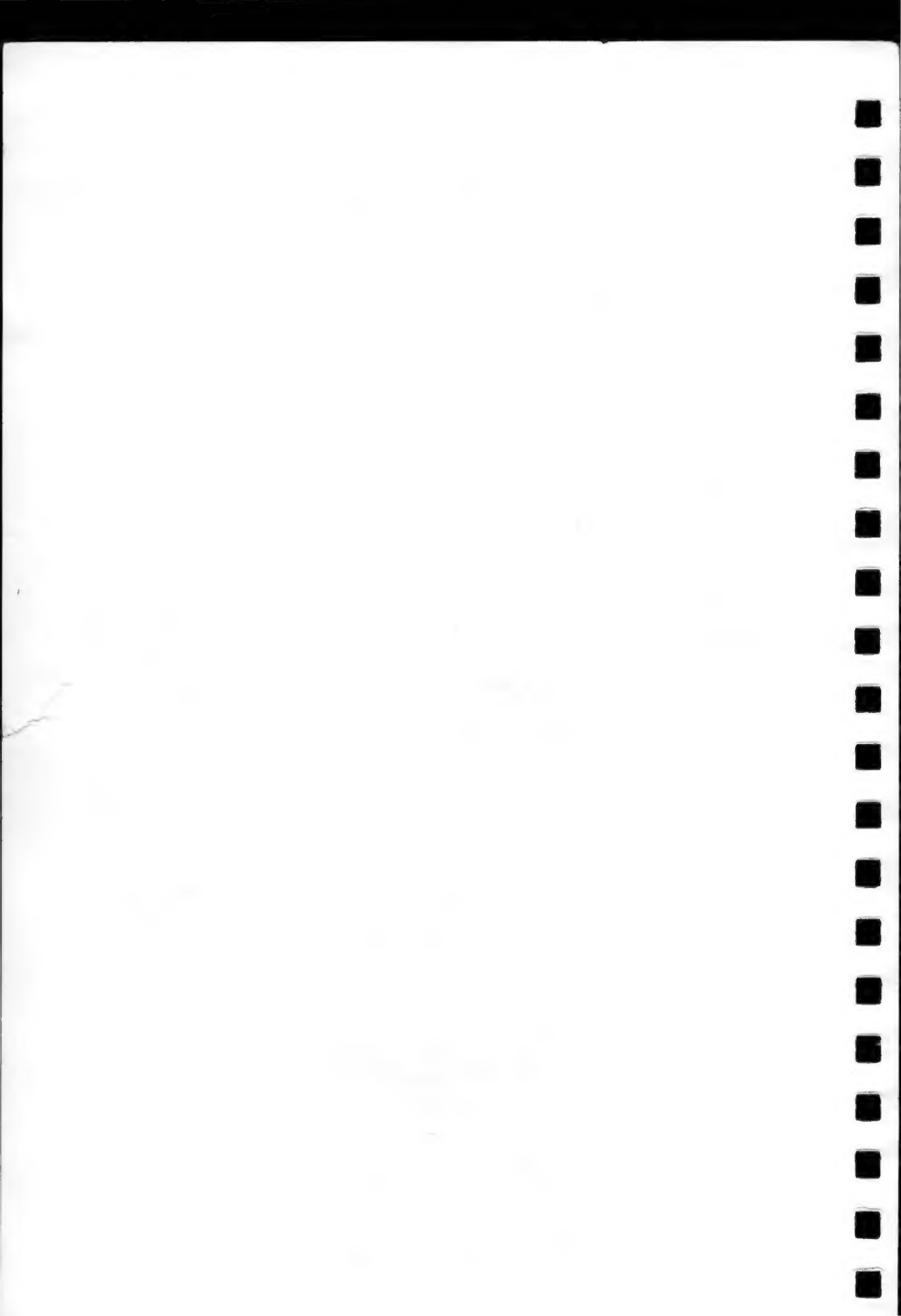

**COMMODORE
64/128K**

THE ADVANCED OCP ART STUDIO



U S E R

M A N U A L



The Advanced OCP Art Studio

BEFORE YOU DO ANYTHING make a backup copy of the Advanced Art Studio. Keep the original as a security copy, and always use a backup.

WARRANTY (what to do if it doesn't work)

If this program is faulty or fails to load, please return it (without the packaging, but ensure it won't get damaged in the post) to the address below and it will be replaced free of charge. This offer does not affect your statutory consumer rights.

**Rainbird Software
Returns Department
First Floor
74 New Oxford Street
London WC1A 1PS**

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**Original program and concept by James Hutchby
Commodore version written by Chris Saunders
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THE ADVANCED TM ART STUDIO

**COMMODORE
64/128K**

FEATURES

- * Windows - icons - pull down menus - pointing devices
- * Operates in Multicolour mode, with full control over colour attributes
- * All information on screen - no need to repeatedly switch between the picture and a menu screen
- * Compatible with keyboard, joystick, Datex mouse and Koala Pad
- * Continuous display of cursor coordinates.
- * Cursor may reflect current ink colour, current pattern, or pen, or may be shown as a cross-hair to aid alignment
- * 48 sizes of grey-scale screen dump are available on Commodore bus and Epson compatible printers which support bit-image mode, plus user-defined printer driver option
- * Save, load and merge pictures to and from cassette and disc
- * Colour priority and exclusion lists, enabling powerful manipulation of all colours, such as drawing behind areas of the screen and ignoring any colours during cut and paste operations
- * Multicoloured pattern fills, 12 user-definable patterns from 1x1 up to 12x16 can be saved to and loaded from cassette or disc. Comprehensive pattern edit facility
- * 16 drawing pens, 8 random spray cans, 12 user-definable multicoloured brushes
- * Windows can be inverted, cut and pasted, enlarged, reduced, squashed, stretched, flipped and rotated. Colour change facility. Windows may be saved to disc enabling libraries of picture elements to be compiled and called up onto the screen at any time for rapid picture creation
- * Text - 9 character sizes, 4 directions, bold and italic with variable spacing. 91 User-definable font characters with comprehensive editor. Fonts may be saved to and loaded from cassette or disk
- * 3 levels of magnification with pan and zoom, pixel clear and plot
- * Points, lines, triangles, rectangles, circles and rays with elastic facility
- * Program setups may be saved to cassette/disk and reloaded. Automatic loading of specified setups, character font and patterns on program startup

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How to load ADVANCED ART STUDIO

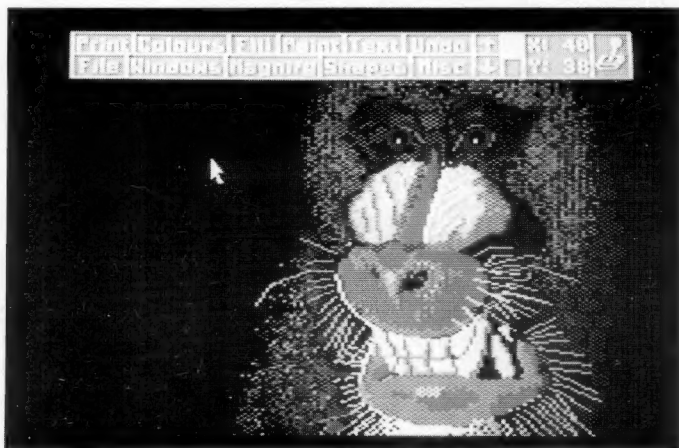
Before you can use the ADVANCED ART STUDIO, you will need to configure the program to suit your own printer. Cassette users should refer to Appendix 1 and disc users to Appendix 2.

How to use this manual

If you want to 'jump in at the deep end', then read the introduction below, which explains the basics of the ADVANCED ART STUDIO and how to control it. This will enable you to begin using the package without further instruction. Explore the program at your own pace, to get a 'feel' for its structure and workings. Don't be afraid to experiment. Read the rest of this manual to clear up specific points and for reference. You are not expected to read the manual all the way through before using the program for the first time.

INTRODUCTION

ADVANCED ART STUDIO is built upon the 'windows - icons - menus - pointing devices' concept as pioneered by Xerox at Palo Alto and popularised by Apple with the Lisa and Macintosh computers. The guiding philosophy behind these developments is that a program should be easy for the first-time user to operate, with all relevant information visible on the screen and the entry of long and complicated command sequences via the keyboard avoided. Instead, the commands are issued by simply pointing to the appropriate option within a menu and pressing a select button.



When you first run ADVANCED ART STUDIO, you will be presented with a clear screen containing a blue and white 'menu bar' at the top and a small arrow shape in the centre. The arrow (known as the 'cursor') is the key to operating the program, and its position on the screen is controlled by an input device, which may be the keyboard, a joystick, a Koalapad or a mouse. For example, when using a joystick, pushing the stick to the left will start the cursor moving to the left, and so on. Movement of the cursor by the keyboard or joystick is 'intelligent', in the sense that it speeds up the longer the stick is held or the key is pressed, while movement of the mouse will cause the cursor to move in exactly the same way. Finally, the Koalapad will position the cursor at the point on the screen corresponding to the position of the finger or stylus on the pad, and hold it there after its removal.

The menu bar at the top of the screen contains a number of individual boxes, some giving information about the state of the program, and others providing a variety of commands which may be given by pointing to them with the tip of the arrow and pressing 'select', which will be the fire button on the joystick, the SPACE BAR on the keyboard, or one of the buttons on the

mouse or Koalapad. When one of the commands is selected, a more detailed menu of options and operations will usually be drawn on the screen, partly overlaying the main menu bar - this process is known as 'pulling down' a menu. This 'sub-menu' contains a number of entries, which may lead to further sub-menus, or cause certain actions or commands to be performed. An option is chosen by pointing to it with the cursor (it will 'highlight' if it is available) and pressing select - this process is known as 'clicking' an option. If the option is a command, the menu will normally be removed and the cursor will be changed to an icon that bears some relation to the command selected as a reminder of the current mode. For example, selecting 'Pen' to paint on the screen changes the cursor shape to that of a small pen, and in this mode the cursor may be moved about the screen as before, with the actual painting being performed by pressing 'select'.

If the icon is moved into the top menu bar it will return to the arrow form, allowing further menus to be pulled down and new commands given. However, if it is moved out again, it will revert to the previous icon unless a new mode has been selected from a menu, in which case the icon will represent the new mode of operation. It is quite possible to access most commands, such as changing the current colour or scrolling the screen, without losing the current mode of operation.

If an option in a pulled-down menu is highlighted as the cursor is moved over it, then that option is available and may be selected. Some of the options in a menu will only be available if certain conditions elsewhere have been met. As an example, when the 'Print' menu is pulled down, the 'Double Density' option may only be selected if the printer has been configured to support printing in double density mode.

Some menus also contain options which do not execute commands or lead to sub-menus, but instead are used to control other aspects of the operation of the program. Some of these are known as 'switches', which may be set to one of two states, either on or off - such options have either a tick or a cross next to them to indicate their current state. One example is the 'Bold' switch in the Text menu, which causes characters added to the picture to be printed in bold type when it is turned on, and normally when turned off. The state of these switches may be 'toggled' by pointing the cursor to it and 'selecting'. Other options may have a number of different states, and generally have some indication next to them, in place of the tick or cross, to indicate their present value. One example is the current ink colour in the 'Colours' menu, which has a small box next to it showing the current colour used for drawing and plotting. The ways in which the values of these options are selected vary according to the particular option and the type of value that it holds, and are described more fully in the appropriate section of this manual. Occasionally, a number of different entries in the menu are used to set the state of a switch - such as the dot density used when dumping the screen to a printer, which may be single or double. Here, a tick is put next to the value currently assigned to the switch, and the value is changed by selecting one of the other entries.

The full Commodore 64 screen holds 25 'lines' of characters, but the main menu bar permanently covers the first three of these. However, the picture that can be created by ADVANCED ART STUDIO incorporates all 25 lines, even though only twenty-two are visible at once. The two boxes in the menu bar containing the vertical arrows are used to 'scroll' the visible portion of the picture over its full range, with the actual section on display indicated immediately to the right of the arrow boxes. The outline of the indicator represents the whole of the picture, with the highlighted rectangle moving inside it representing the section currently shown on the screen.

Most menus can be easily removed from the screen if pulled down by mistake by moving the cursor outside them and pressing select. However, certain menus such as 'Colours' may only be removed by selecting the 'Cancel' or 'Exit' options.

The bulk of this manual is divided into sections, each one covering one of the options in the main menu bar. The sections logically follow the same order as the menu, reading from left to right and then top to bottom.

USE OF COLOURS IN THE PICTURE

A 'pixel' is a single dot on the screen - the smallest picture element. The pictures created by ADVANCED ART STUDIO contain 160 pixels in the horizontal, or X direction, and 200 in the vertical, or Y direction. Each pixel in the picture is identified by its own set of coordinates, which start at 0,0 for the pixel in the top left corner of the screen and range up to 159,199 for the one at bottom right. When the cursor is over a pixel in the picture, and no other sub-menus are displayed, its coordinates are displayed in the top level menu bar, allowing objects in your drawing to be aligned more accurately.

The screen is divided into a number of 'cells', each one containing 4 pixels in the X and 8 pixels in the Y direction. (Note that because each pixel is twice as large across as it is high, these cells are actually square.) This division of the screen is imposed by the hardware of the computer, and is used to allocate colour information to the pixels within each cell. ADVANCED ART STUDIO uses the Commodore screen in Multicolour bit-mapped mode, which allows at most four different colours to be displayed in each cell, one of which is known as the 'paper' colour and must be common to all cells. This paper is used, therefore, as a background to the whole picture - a pixel is said to be 'cleared' if it is shown in this colour. The three remaining colours may be selected separately for each cell, and it is quite possible (though unlikely) that the paper colour is not used at all. Although this restriction is of fairly minor concern when creating pictures, you should bear it in mind when trying to add very fine colour detail. ADVANCED ART STUDIO will allocate colours to cells automatically, and if a cell already contains pixels in three different colours apart from the paper, it can only add a new one by deleting the pixels in one of the old colours and changing the now unused colour for the new one. (This process can be modified using the priority list as described later in the section on the 'Colours' menu). Note that the paper, and all three of the ink colours for each cell may each be chosen without restriction from the full set of 16 colours normally available on the Commodore 64.

CONNECTING INPUT DEVICES

As mentioned previously, ADVANCED ART STUDIO will accept its input for moving the cursor and making selections from one of four different input sources, namely the keyboard, joystick, mouse or Koalapad. However, although you may switch freely between these devices, it is only possible to use one of them at any time. The device from which ADVANCED ART STUDIO is expecting to receive its input is indicated by an icon in the right hand box on the top level menu bar, and may be changed at any time by pressing the SPACE BAR together with the Commodore key (at the bottom left corner of the keyboard), then releasing both. This process may be repeated until the icon matches the desired device. Note that the joystick, mouse and Koalapad may be plugged into either of the input ports, and it is possible to have a joystick in one port and a mouse or Koalapad in the other and select between them with the process described above.

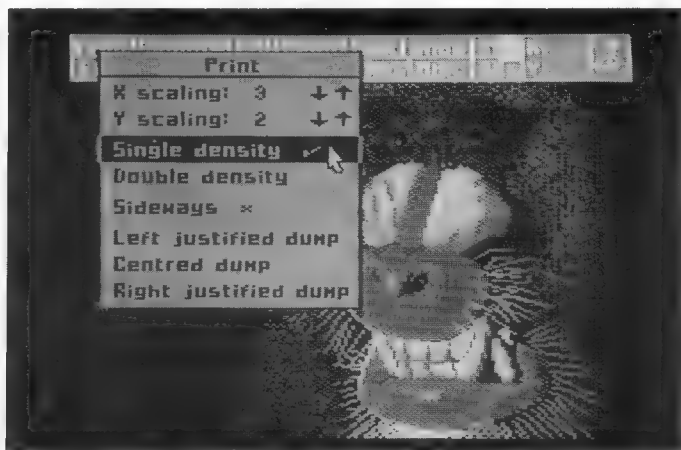
At certain times, ADVANCED ART STUDIO will change the device icon when it expects input from a particular device for carrying out special operations. An example is the input of a filename, which can only be entered using the keyboard. When this happens, the specified device should be used and the icon will change back when the operation has been completed.

When using the keyboard to move the cursor, the following keys are used to control its direction:

£ - Up * - Left ^ - Right = - Down

The SPACE BAR is used to issue commands and 'click' menu selections.

PRINT



The commands and switches on the Print menu allow you to take a hard copy of your finished picture using virtually any dot matrix printer, providing you have correctly configured the printer driver. Information on how to do this is contained in the appropriate appendix at the back of this manual.

In order to allow for a large variety of aspect ratios (the difference in the spacing of dots in the vertical and horizontal directions on different printers), the menu allows you to select the scaling of your printed picture separately in the X and Y directions, from 1x1 up to 16x16. The scaling gives the number of dots printed on the paper in the X and Y directions for each pixel in the picture. Not all sizes of dump will be available on your printer, as each has its own maximum number of dots available across the paper, and ADVANCED ART STUDIO will only permit selection of X and Y scaling factors which will produce a valid dump. For example, the Commodore MPS 801 permits a maximum of 480 dots across the paper and hence a maximum X scaling factor of 3, while the Y scaling may take any value as the length of the print is not restricted. To change the X and Y scaling factors, select the up and down arrows to the right of the scale to be changed. The current value is always displayed next to its title.

The colours of your picture are represented using a 'grey scale' dump, which uses a different pattern of dots (known as 'stipples') to represent the various different colours, ranging from a solid pattern of dots (black) down to a complete lack of dots (white).

While the dump is in progress, the entire picture is displayed on the screen, and the dump may be aborted at any time by pressing the RUN/STOP key

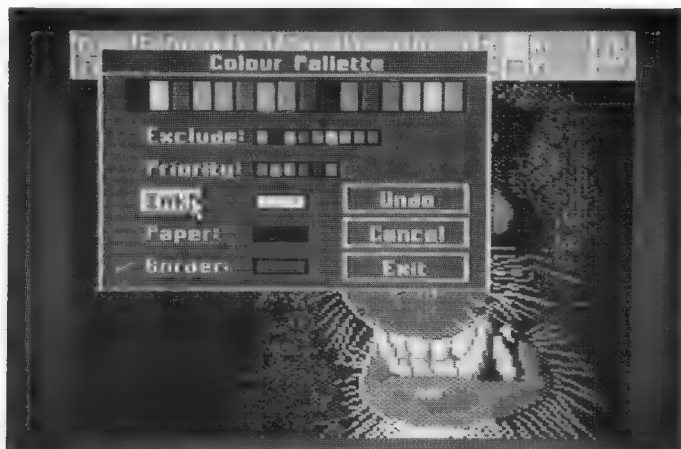
which will cause an error message to be displayed on the screen. Note that you may need to reset the printer to stop the partial contents of a print buffer from being printed at the start of the next picture.

Most dot matrix printers are capable of operating in two different modes, known as single and double density. The latter causes the spacing between the dots in the horizontal direction to be halved, causing neighbouring dots to overlap, which produces a far denser picture which generally looks more natural. However, the vertical spacing remains the same, hence the X and Y scaling factors will need to be adjusted to keep the picture proportions correct. Note that the program will allow a greater scaling factor to be selected when double density mode is used because of the greater number of dots available across the paper. If your printer does not support double density mode, the selection is not made available.

It is possible to print a picture sideways, from left to right, rather than from top to bottom. Since the multi-coloured bit mapped screen has a greater size in pixels from top to bottom, the selection of different scaling factors may be restricted more than in left to right mode. However, it may be necessary to use the sideways option with a suitable scaling factor in order to produce a properly proportioned dump of your picture.

The three options at the bottom of the menu perform the dump itself, positioning it in the selected manner across the paper. 'Left justified dump', for instance will print the picture down the left hand side of the paper, while the others print it centrally (with equal left and right margins) and down the right hand side of the paper respectively.

COLOURS



The Colours menu allows you to select the colours used for drawing objects in your picture as well as others such as the paper colour and border colour. It also lets you control the way in which ADVANCED ART STUDIO colours your picture in a very sophisticated manner by allowing you to set up two lists of up to 15 colours which are then scanned by the program whenever you make changes to the picture.

The first list is known as the 'exclusion list' and, as its name suggests, causes ADVANCED ART STUDIO to exclude the colours in it from most operations. For instance, when painting with a brush containing red, green and blue inks, adding blue to the exclusion list would result in only the red and green parts of the brush being plotted. More usefully, colours may be excluded from window operations to prevent the backgrounds around objects from being copied or for protecting certain colours from being removed by the 'Clear window' command.

The second list is known as the 'priority list', and gives any colour in it a higher priority than all those colours either not in it or below it in the list. The main function of this list is to control the way in which colours replace each other in the picture during operations such as painting, copying windows, merging, and so on. Using the priority list, it is possible to impose a 'depth' on the picture, where certain objects can be made to appear in the foreground relative to others by giving the foreground colours a higher priority than the background colours, changes can be made to the latter without disturbing the former. For instance, if a shape has been drawn in red and yellow, these colours can be put at the start of the priority list, and if a window operation were then used to copy a section of picture into the area

surrounding the shape, the copied colours would appear to be 'behind' it, as the copied colours would not be able to replace the red or yellow. This feature allows objects at the front of a picture to be drawn first and the background coloured in later.

The other three items that may be set using the Colours menu are the Ink colour, which is the colour in which items such as pens, lines and characters are drawn, the paper colour, which is the background colour used for the whole of the picture, and the border, which is the colour of the border that fills the gap between the edges of the picture and the edges of the screen.

The Colours menu consists of a box containing the palette of all 16 Commodore 64 colours together with the five items described above, each with a display of their present values. In the case of the lists, up to 15 small boxes of colour may appear to the right of the name showing its contents. If the list is empty, however, the words 'Not defined' will appear instead. A tick is drawn next to the item currently being defined - the tick is moved by simply selecting the name of the required item. The colours for the selected item are entered by clicking on the required colour in the palette box at the top - if the item is a list these colours will be added on the right hand side. Since the colour priority list works from left to right, the highest colours should be entered first. To clear a list, move the cursor to the tick to the left of its name and click on it a second time. Note that the order of colours in the exclusion list does not make any difference to its operation.

Finally, three other commands may be selected while in the Colours menu, namely Exit, which removes the menu and makes the new settings permanent, Undo, which restores the settings to the state they were in when the menu was pulled down, and Cancel which combines both Undo and Exit.

In some cases it is useful to be able to 'rub out' areas of the pictures. This can be done by selecting the current Ink colour to be the same as the current paper colour. Any drawing now done with pens, lines, sprays etc. will set the pixels to the background colour instead of adding different colours to the picture. This facility assists greatly in selectively removing areas of the picture, and since it is effectively drawing in background colour, it is subject to the contents of the exclusion and priority lists.

For the sake of convenience, the Colours menu is also available from the Fill, Paint, Text and Windows menus.

FILL



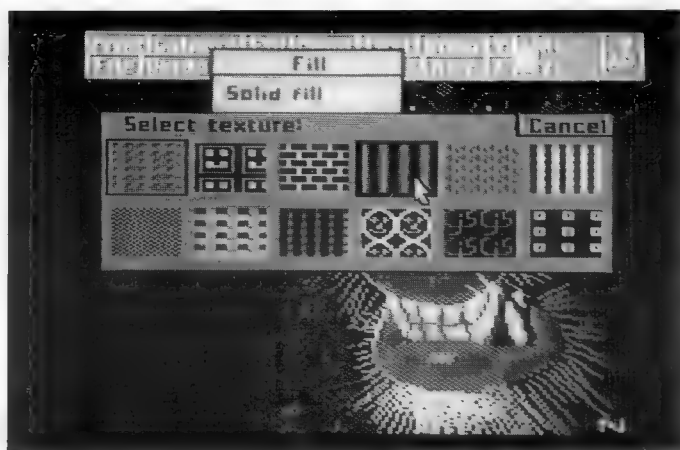
Filling is a technique for rapidly colouring all the pixels within an object or shape on the screen. The object to be filled must have a continuous outline, but may be quite complex. The object can be filled with either a solid colour, or a user-definable pattern as required.

To fill an object with a solid colour, select the 'Solid fill' option after pulling down the Fill menu. The cursor will change to a representation of a paint roller, which can then be moved to the object to be filled and select pressed. The fill operation will proceed outwards from the chosen point until a pixel is found with a different colour to the first one, or the edge of the picture is reached.

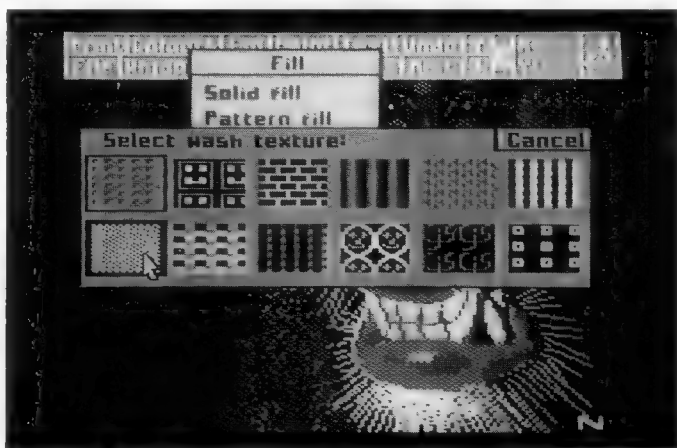
Note that fills take place over the whole picture, and not just the visible 22 lines - the screen may be scrolled up and down to check the results of the fill.

A fill can be aborted using the RUN/STOP key, and if an error is made or a fill 'leaks' out of an object, it can be removed using the 'Undo' option.

Solid filling is performed in the current Ink colour set by the Colours menu, making reference to the priority list when some contention takes place for colours within a cell.



To fill an object with a pattern, select the 'Pattern fill' option from the Fill menu - a menu is then displayed showing the twelve User-defined patterns as fill textures. Click the desired texture, then move the cursor as before and press select. The textured fill is a two-stage process - first a solid fill is performed, then the texture is 'mapped' onto all pixels in the picture that were altered by the solid fill. No reference is made by a pattern fill to the current Ink colour. Instead the colours are taken from the pattern definition.

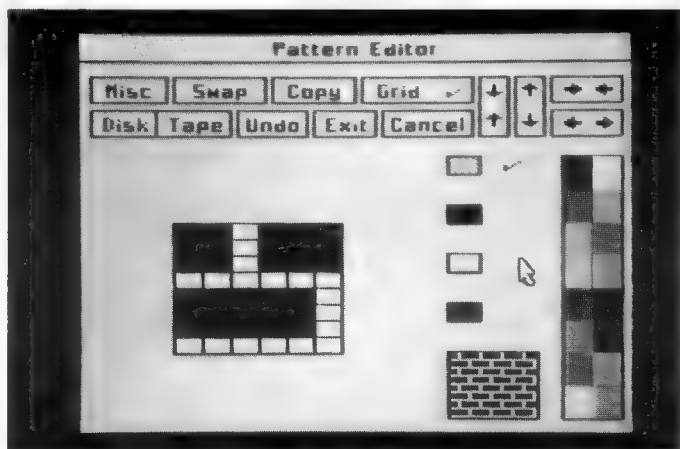


The last operation of the patterned fill process may be used as an operation in its own right, and will have the effect of 'mapping' the chosen texture onto the pixels changed by the most recent operation, such as normal paints,

copies, text etc. It must, however, be performed immediately after the operation. For example, the Shapes menu could be used to draw a rectangle, and then 'Wash pattern' could be used with a stippled texture pattern to get a dotted outline, or a striped texture could be washed onto a line of text for unusual lettering.

The twelve patterns may be edited to suit your particular requirements by selecting the 'Edit patterns' option from the Fill menu (see next chapter). In addition, the Colours menu described before may be called from the Fill menu for convenience.

PATTERN EDITOR

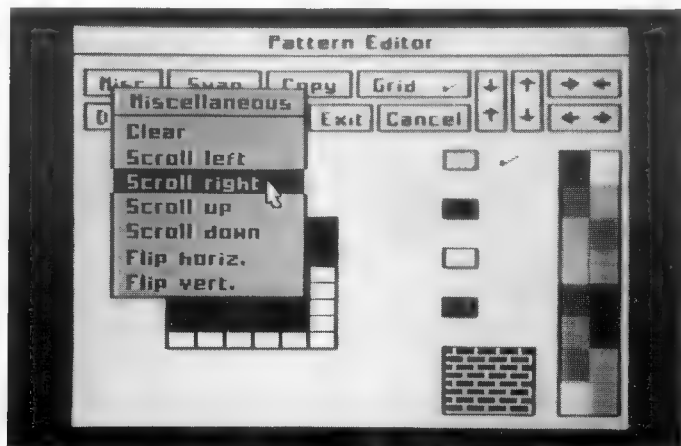


The pattern Editor provides a comprehensive method of altering the current user-defined pattern as well as performing functions such as changing its colour definitions and saving and retrieving sets of patterns on disc and cassette. Using these files, a large library of commonly used and specialised patterns can be created and filed, then a particular set loaded in whenever required.

The current pattern (the last one selected from the Pattern fill or Wash pattern sub-menus) is displayed eight times its full size in the lower left hand corner of the menu, together with a set of command options at the top and a colour palette down the right hand side. Four ink boxes in between the enlarged pattern and the palette indicate the colours assigned to the current pattern and a tick next to one of these indicates the one currently being edited. Last of all, a large box below the ink colours is constantly filled using the current pattern so that the effect of any changes can immediately be seen. Clicking on this box provides a 'short cut' for performing patterned fills with the current texture by exiting the pattern editor and entering the fill mode.

The pattern may contain up to three different foreground colours, or 'Inks', and a transparent colour (represented by shaded boxes). When a pattern is put on the picture, transparent pattern pixels will show the old colour for that particular point and will not be affected, enabling objects to have 'holes' that allow the background of the picture to show through. Note that whenever a pattern is displayed in normal size in a menu, the transparent pixels are shown in black ink.

To alter a pixel in the pattern, simply point the arrow cursor to it and press select. The pixel will be changed to the ink contained in the box that has a tick next to it, and the cursor can be moved around with select held down to speed up the editing process. To change the colour assigned to the current ink simply point at the new colour required in the palette, when the ink inside the box will be changed to this value and all pixels in the pattern that have been defined in that ink will also reflect the new colour. To change the Ink box currently selected, simply click on the new Ink required whereupon the tick will move next to the new box. Obviously, transparent pixels have no colour and hence a new one cannot be assigned to the shaded ink box at the top.



The 'Misc' option at the top of the menu provides a sub-menu of useful functions that can be used to edit the current pattern. The 'Clear' option on this menu sets all pixels in the pattern to transparent ink, and the four scroll operations shift all pixels in the pattern by one pixel in the chosen direction (the line or column that moves off the edge of the pattern comes back on the opposite side). Finally, the pattern may be flipped in the horizontal or vertical directions as required.

The 'Swap' option allows the current pattern to be swapped with one of the other eleven patterns by drawing a sub-menu containing all twelve patterns as fill textures. Click on the pattern required or select the 'Cancel' option.

The 'Copy' option lets you copy one of the other patterns into the current one, deleting all the current pixels in the process. This is useful for forming a set of similar patterns, and is done in the same way as the Swap command.

The enlarged view of the pattern may have a pixel grid superimposed on top

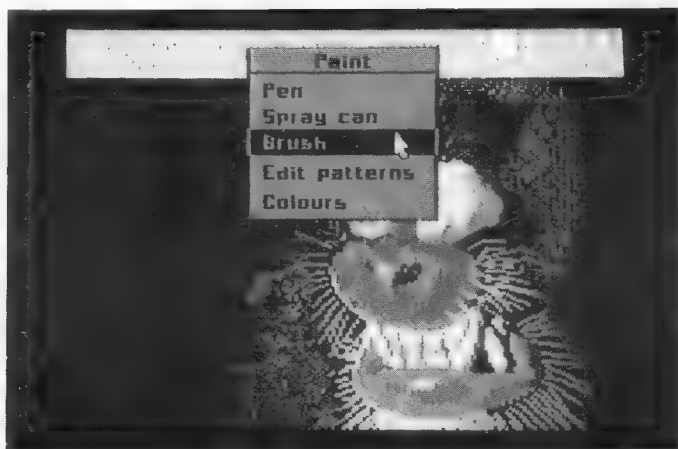
to aid the positioning of the coloured pixels. This grid may be turned on and off by clicking the 'Grid' switch, the enlarged pattern being redrawn each time.

The sizes of each pattern may be selected independently in the X and Y directions by using the four boxes containing arrows in the top right corner of the menu. The X dimension can take any value from 1 to 12, and the Y dimension any value from 1 to 16. To change the current dimensions, click on the box that reflects the change required - for example, the box with two vertical arrows that point together will reduce the height of the pattern. Their operations will repeat as long as select is held down.

The 'Disc' and 'Cassette' options allow operations on files of patterns, and invoke the same menus as described later in the 'Files' section. The only difference between the disc and cassette menus called up from the Pattern Editor and from the Files menu is the lack of the 'Merge' option. The disc menu will list all the pattern files on the current drive instead of picture files, but is used in exactly the same way. For a full description of how to use the Files menu, consult the FILES section of this manual.

Finally, the 'Undo' option removes the effect of any changes that have been made since the editor was called up, the 'Exit' option makes the changes permanent and exits the Pattern Editor, and the 'Cancel' option will combine both the Undo and the Exit and abort the edit without making any changes.

PAINT

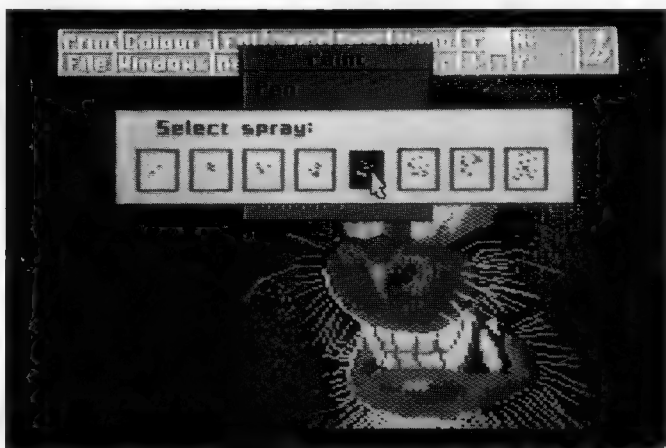


This menu provides some of the most commonly used facilities for drawing objects in the picture using the cursor, namely the pen, spray can and brush.



Sixteen redefined pens of various shapes and sizes are provided. To use one of these, select the 'Pen' option from the Paint menu. A menu will be drawn containing sixteen boxes, each with a different style of pen inside.

When you click on the shape required, the menus will be removed and the cursor will change to the representation of a pen. This icon can then be moved around the screen, pressing select to perform the painting operation, and it may be moved with select held to allow continuous lines and shapes to be drawn. The current Ink colour as defined in the Colours menu is always used to provide the pen colour, with reference being made to the exclusion and priority lists, which enables lines to be drawn behind objects in the foreground. Obviously, if the current Ink colour is given, by setting the current Ink to match the Paper colour the pen can be used as a very effective eraser.



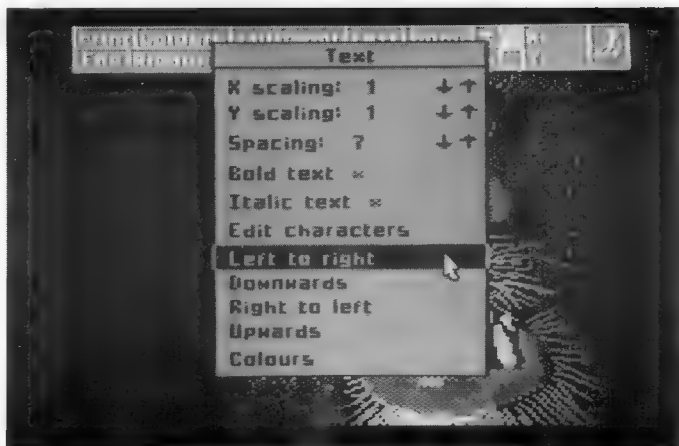
Eight spray cans with a range of diameters are available which may be used to spray a random pattern of dots on the screen. This random nature can be shown by selecting one of the larger sprays and holding down select while keeping the cursor in the same place - eventually, a solid disc will be drawn. The spray can may be moved while painting to produce graffiti-like effects.



The twelve user-defined patterns may be used as paint brushes, placing the current pattern underneath the cursor when select is pressed. In addition, the patterns may be edited from the Paint menu, which will invoke the Pattern Editor in a similar manner to the Fill menu, but with one difference. When the pattern editor is invoked from the Fill menu, the views of the patterns shown in normal size are displayed as fill textures, but in the Paint version of the editor they are shown as single brush patterns. They are, however, still the same set of patterns, and all the operations performed in the editor work in the same way in both versions.

Finally, the 'Colours' option may be used to select new colours for painting operations and amend the exclusion and priority lists from within the Paint menu for added convenience.

TEXT

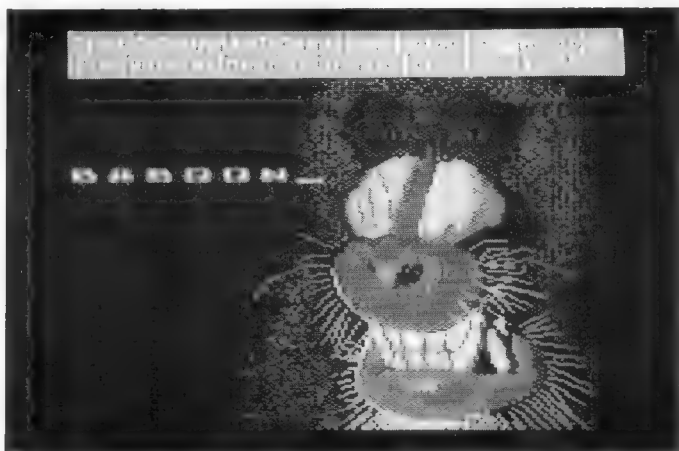


ADVANCED ART STUDIO permits the addition of text to your picture using a set of characters which can be defined to suit your requirements. This character 'font' may contain any numbers, letters, punctuation or special symbols that may be defined within an 8x8 block of pixels using one colour only. Printing of characters may be performed in a variety of sizes in four different directions, with a number of special features available. Characters are always added in the current Ink colour, with usual reference to the exclusion and priority lists being made.

The scaling of the characters in both the X and Y directions may be set using the first two options on the Text menu, and range from 1 to 3 in both. Use the arrows to change the current sizes, which are always displayed.

The character spacing may be set using the next entry on the menu, and this sets the number of pixels by which the cursor is moved in the current direction after a character is printed. This is useful when entering characters which do not use the full 8 pixel width in order to increase the number of characters that may be fitted across the picture. Note that the value set on the menu for the spacing will be multiplied by the scaling factor in the direction of entry.

The next two options, 'Bold' and 'Italic' may be used singularly or together to print individual characters in special ways. Bold causes the characters to be printed twice, the second time shifted one pixel to the right to make them 'stand out' from the rest. The Italic switch causes the upper rows to be shifted to the right relative to the lower rows, thus making them appear in italic type.



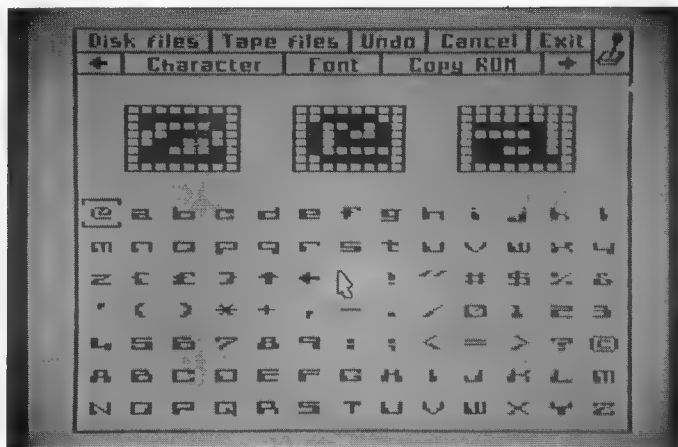
The lowest four options on the menu perform the entry of text itself, in the direction indicated. When one of these is selected, the cursor will change to an icon resembling a capital I in the same size as the characters that will be printed. This cursor can be moved around as required, and select pressed to enter 'text entry' mode, when the cursor will change to an underline character.

The keyboard can then be used to enter characters as required, using the SHIFT key as needed to obtain upper case letters and special characters. If a mistake is made, the INST/DEL key may be used to delete the last character. In the default character set supplied, the copyright symbol is obtained by shifting the asterisk key. Finally, the RETURN key is used to exit from text entry mode and recover the I cursor.

The 'Colours' menu may be invoked from here by selecting the appropriate option from the menu.

The remaining option on the text menu, 'Edit characters' invokes the Font Editor, which may be used to alter the character set used in text entry mode.

FONT EDITOR



The character font used by the text editor contains 91 characters, which correspond to Commodore screen display codes 0 to 90 (these are the numbers which may be POKEd into the screen memory from BASIC to display characters from @ to Z using the screen in standard character mode). The character fonts created with the font editor may be saved to and loaded from cassette or disc in the same way as files of user-defined patterns.

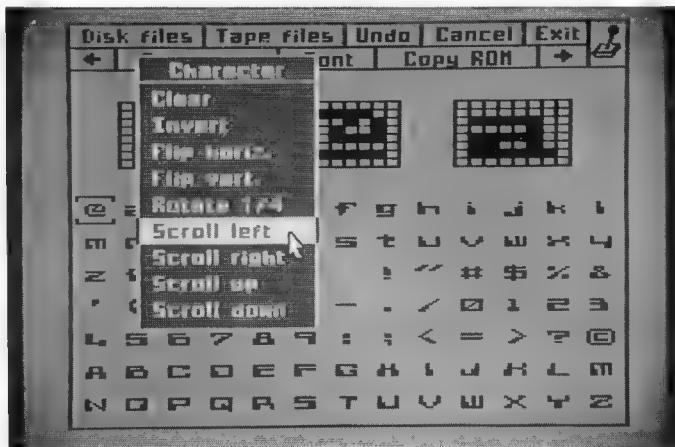
The 91 characters are displayed in normal (1x1) size in the lower half of the font editor menu, each consisting of 8x8 pixels, each of which may be set or reset. One of the characters is marked as the current character by a top and bottom cursor, and is displayed four times full size in the top centre of the menu. In addition, the characters before and after it in the font are also shown enlarged to the left and the right of the current one. The individual pixels in these three enlarged views may be toggled by pointing to them with the arrow cursor and pressing select.

A particular character may be made into the current one by clicking its normal size view with the cursor. Alternatively, the two arrow boxes in the rows of options at the top can be used to scroll left and right through the font. The scrolling will auto-repeat if select is held down.

The disc and cassette file menus may be called up from the font editor menu (see the FILES section for a full description of these) to save and load files using the disc or cassette drives. The disc menu used from within the font editor menu will list only the character font files contained on the current disc and both menus will only load character font files, ignoring all others. A

font file contains 728 bytes of data (91 characters x 8 bytes each).

The 'Undo', 'Cancel' and 'Exit' options on the font editor menu have their usual functions and are used to exit the font editor and/or remove any changes made to the font since the editor was invoked.



The 'Character' option produces a sub-menu of operations that may be performed on the current character. These operations can be used to clear the character (resetting all pixels), inverting the character (toggling all pixels), flipping the character in the horizontal and vertical directions, rotating the character by one quarter of a turn clockwise and scrolling the pixels of the character in all four directions. The 'Font' option produces the same sub-menu of operations, but applies the selected function to all characters in the font. These functions will auto-repeat as long as select is held down.

Finally, the 'Copy ROM' option is used to copy the standard character set from the character generator ROM of the Commodore 64. This gives access to the same characters that are generally used by BASIC programs for listing and editing programs.

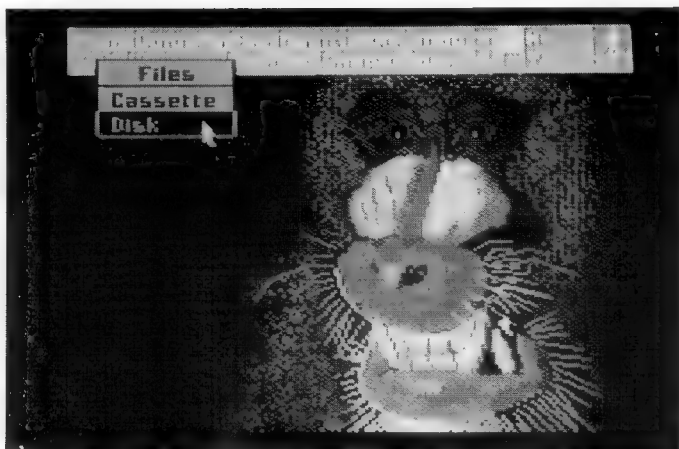
UNDO

This is one of the most useful features of ADVANCED ART STUDIO, since it allows the effect of the last command or operation to be cancelled.

When a command such as Fill, Paint, Clear screen and so on is given, the picture is copied into a backup store in the memory before the operation is performed on the main screen. If the result is not quite the desired one, then the backup screen may be copied back into the main picture. The Undo facility must, however, be used straight away otherwise the picture will be backed up again and the original screen copy lost.

Certain operations need to use the memory allocated to the backup screen in order to hold the picture while displaying something else, such as the magnify, pattern and font editors and view screen options. The screen is backed up after selecting these options, and hence the last copy will be lost and an Undo will not be possible afterwards.

FILE



ADVANCED ART STUDIO provides extensive support for the storage and retrieval of various types of files using both the cassette drive and up to four different disc drives. All files have a name associated with them of 16 characters in length, of which the last four are reserved by ADVANCED ART STUDIO to aid the distinction between different types of file, such as picture, font, etc.

The operations on cassette and disc files are performed through two different menus - the Cassette menu and the Disc menu. These are available through various other menus such as the Files menu, which calls the Disc or Cassette menus to operate on picture files, and the font editor, which calls the same menus, but uses them to operate on character font files. In addition, the pattern editor will call the Disc or Cassette menus to operate on files containing user-defined patterns and the Miscellaneous menu will call on them to operate on program setup files. Certain selections on these menus will only be made available when called from a higher level that makes use of these functions.

To perform operations on picture files, pull down the Files menu from the top menu bar and select either the 'Cassette' or 'Disk' options. The appropriate sub-menu will then be drawn with the title 'Picture files' acting as a reminder that all commands given will operate only on this type of file.

CASSETTE FILES



This menu allows files of the specified type to be saved to cassette, loaded from cassette and verified against files already on cassette. In addition, when used to operate on picture files, two additional entries are available, one of which allows high resolution pictures created by ART STUDIO to be converted to multicolour bit-mapped pictures and loaded by ADVANCED ART STUDIO, and the other one allowing picture files already on cassette to be merged with the picture currently displayed on the screen. Obviously, neither of these options apply to any files other than pictures, and are removed from the menu in these cases.

'Save' allows the current file, be it picture, character font, patterns or setup to be saved onto the cassette. Selecting this option causes ADVANCED ART STUDIO to ask for a filename which it then uses to identify the file on the cassette for later retrieval. Enter the filename (up to 12 characters) and then press RETURN. ADVANCED ART STUDIO then asks you to press PLAY and RECORD on the cassette drive if they are not already pressed, and then performs the save operation itself. Control returns to you as normal once the operation has been completed, but it may be aborted prematurely using the RUN/STOP key as is normal with cassette operations. The RUN/STOP key may also be pressed during input of the filename or while waiting for PLAY and RECORD to cancel the request and return to the normal menu processing. Note that the screen is blanked out as usual during all cassette save and load routines.

'Load' performs the reverse of the Save operation, allowing files that have been saved previously to be loaded in by name. The filename entered must match the one used to save the file otherwise it will not be found. Note that,

unlike BASIC, it is not possible to simply load the next file on the cassette by using a blank name unless it had been saved in the same way.

'Verify' allows the contents of a cassette file to be checked against the current contents of the memory. Again, the filename must be entered exactly as used to save the file, and if the contents of the file are found to be different to the memory, an error message is printed on the screen. If all is well, however, control will simply return you without any comment.

'Merge' is only available for picture files, and permits the file loaded from cassette to be mixed with the currently displayed picture to produce a combined display of the two. What happens here is that the picture currently on the screen is used as a background, over which the new picture is copied in a manner similar to a window copy operation. Here the priority lists are used to resolve conflicts between the colours in both pictures and to prevent certain areas in the current picture from being overwritten. The exclusion list will prevent the specified colours in the new picture from being added to the old one.

The final option, again only available when dealing with picture files, tells ADVANCED ART STUDIO to look for a high resolution bit-mapped picture file that was created by the standard version of ART STUDIO. The reason for making the distinction is that this kind of picture is not normally compatible with ADVANCED ART STUDIO, and work must be done during the loading process to convert it into a format suitable for display. Since these pictures have a horizontal resolution of 320 pixels instead of 160, some loss of fine detail is inevitable. Also, the way in which colours are represented is different, and conversion must take place here as well. Finally, the filenames used for the two different types of picture are different, and ADVANCED ART STUDIO can only find a file on the cassette if it knows the correct name. If the 'Hi-res' option has a tick next to it, then files searched for are expected to have the old form of filename, and the conversion process will be performed on loading the picture. The state of the hi-res switch may be changed by clicking it with the cursor.

DISC FILES



In addition to allowing the saving and retrieval of files of all different types on disc, the Disc menu also allows disc utility commands to be given without the need to enter complicated command sequences in BASIC. ADVANCED ART STUDIO can hold a catalogue of files on a given disc in its memory and display its contents on the screen when required, although only the type of file for which the menu has been called will be listed. When the Disc menu is displayed for the first time, ADVANCED ART STUDIO will attempt to read the directory file from the current drive and store the names of ALL files that it recognises in the memory for later display. Providing this is successful, the disc volume name will be shown at the top of the menu along with the amount of free space remaining, and up to eight filenames will be shown in the box on the right hand side. If, for instance, the menu has been invoked from the Pattern Editor, the first eight pattern files on the disc will have their names shown. If there are more names than there is room in the box, the visible portion may be scrolled up and down using the arrow boxes provided, with the highlighted section in the centre representing the portion of the whole list on display. The list may be 'homed' to the top by clicking the box containing the linked squares symbol.

A filename contained in the box may be made the 'current' name by clicking it with the cursor, when it will be highlighted. Clicking a different name or scrolling the directory will un-highlight it again.

The first group of entries down the left hand side provide commands which apply to the whole disc. The 'Reset' option is used to fetch a new catalogue from the current drive, for instance, when a new disc has been inserted. If ADVANCED ART STUDIO already has a catalogue in its memory, it will not

fetch a new one when the menu is pulled down unless it is told to do so. However, the execution of certain commands will always change the disc's directory, and under these circumstances a new list will be read in when required, sometimes on completion of the command, and other times when the menu is re-drawn.

The 'Clean up' option is used to tidy up a disc that has been used for a long period of time, which may have resulted in the files becoming 'fragmented'. (This means that the files are stored in lots of small pieces throughout the surface of the disc). Although this does not stop the drive from functioning properly, it does slow down the loading and saving of files, and the 'Clean up' command can be issued to tidy up all of these small sections and make disc operations more efficient.

Once a disc is no longer required, it may be cleared to allow it to be used again. The 'Clear' option deletes the whole directory, and will hence destroy all files on the disc. Obviously, this command should not be given in error, and so ADVANCED ART STUDIO will seek confirmation via the keyboard before carrying it out.

Before a new disc can be used to store files of data or programs, it must be correctly formatted. This operation involves initializing the directory of the disc and writing timing and control information over the whole surface of the media, and can be performed by the disc drive itself under program control. When the 'Format' option is selected, a volume name is requested, which you should type in using the keyboard, ending it with the RETURN key. Once this has been done, the format operation will take place, taking a minute or so, after which the new volume name will be shown at the top of the menu and a blank catalogue displayed.

ADVANCED ART STUDIO can support up to four disc drives connected to the Commodore 64, but can only talk to one at any one instant - the number next to the fifth option shows which of the four devices is the current one. Point the cursor at the word 'Device' and hold select down until the number displayed matches the drive required (the first drive is always device number 8), then release it again. The catalogue of the new drive will then be read and displayed.

The next two options perform functions on individual files on the disc, both requiring a currently highlighted filename as described above. The first option can be used to rename a file, and will display the current name at the bottom of the menu, allowing you to modify it with the keyboard. Once the new name is complete, hit RETURN for the command to be performed. This is quite a quick process, as only the directory file needs to be altered. The second option will delete the file whose name is currently highlighted from the disc. Both options will retrieve a new catalogue from the disc and display it straight away.

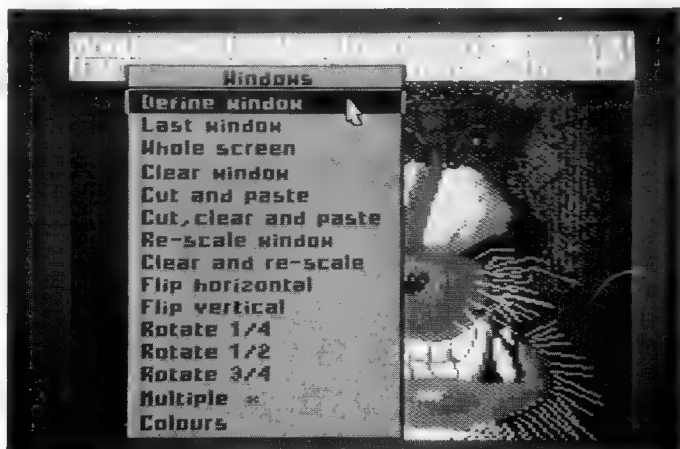
The final set of options perform the same function as their equivalents in the

Cassette menu with a few minor differences. The 'Load' (and 'Merge' if dealing with picture files) option only works if a filename has been highlighted, and will take this name to be the one required instead of asking you to enter one. The 'Save' option uses the highlighted filename if there is one, and replaces this file with the current picture, patterns, font or setup file, but works equally well if no name is selected - in the latter case, you are asked to enter it as with the Cassette menu. On hitting RETURN, ADVANCED ART STUDIO looks in the catalogue held in its memory to see if the name has already been used, and if it has, it checks with you that the same one is to be used again, as this causes the old file to be replaced. Note that it is perfectly possible to have files of different types with the same name, as ADVANCED ART STUDIO can still distinguish between them.

When dealing with picture files, the same process is used to load and merge both multicolour and standard bit-mapped pictures, since the filenames will be distinguished by the program. When displaying directories of picture files, the two letters 'hi' are printed to the right of any filenames belonging to the pictures saved by standard ART STUDIO, and when these files are loaded or merged, the conversion process as described in the Cassette files section is invoked automatically.

Any of the operations described above can be aborted while they are requesting information from the keyboard by pressing RUN/STOP, but since they are generally executed by the drive itself, cannot be aborted while in progress. Care should be taken when using the disc that commands are given correctly.

WINDOWS



A window is a rectangular section of the screen, marked by a dotted outline, which can be operated on as a whole. Windows in the picture can be cleared, copied, moved, re-scaled, flipped and rotated, and in addition may be saved to disc and reloaded later to a different position on the screen. The 'Undo' command can be used after any window operation to remove the effects of the command.

Before any operation can be performed on the contents of a window, it must first be defined. To do this, pull down the windows menu and select 'Define window'. The cursor will change to a small box cursor, which can then be moved about the screen until positioned on one corner of the desired area and select pressed. As the cursor is moved around now, the window will be drawn with the point just defined as one corner and the cursor position as the other. When the desired area has been surrounded with the outline, press select again, which will allow the cursor to be moved without altering the outline. A window can be defined which is partly in the hidden section of the picture by defining the first point and then using the arrow boxes in the main menu bar to scroll the picture before defining the second point.

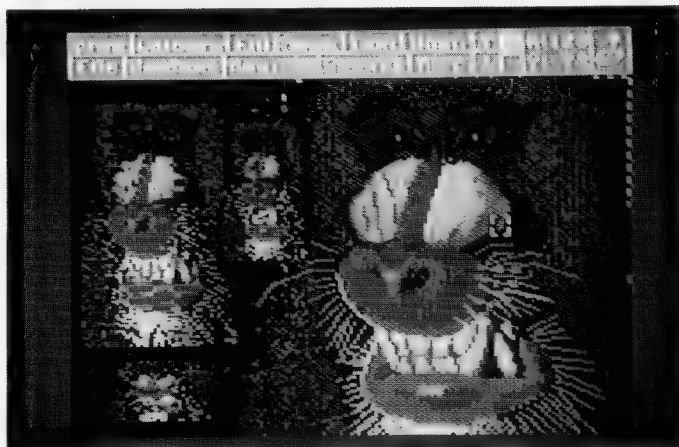
Once the window has been defined, any of the options in the Windows menu may be selected to perform the given operation. It is not necessary, however to have defined a window before choosing an option - if there is no window on the screen when one is chosen, the 'Define window' routine is automatically called to create a window definition, and the operation is then carried out on this window.

The current window may be cleared by clicking the 'Clear window' option.

This has the effect of clearing all pixels inside the outline to the paper colour, subject to the colour priority and exclusion lists.

A window can be copied after being defined by selecting the 'Cut and paste' option. A second window outline then appears, of the same size as the first, which can then be moved about the screen as a whole. When select is pressed, the contents of the first window are copied into the new outline, again subject to the exclusion and priority lists. Note that the second window is moved via the first corner defined in the original window.

The option 'Cut, clear and paste' is similar to the above, except that the original window is cleared after its contents have been read in the same way as if a 'Clear window' had been used, i.e. it effectively moves a window.



A window can be enlarged, reduced, squashed or stretched - actions collectively known as 're-scaling'. A window is re-scaled by selecting either the 'Re-scale window' or 'Clear and re-scale' options, which allow a second outline to be defined in the same way as the first. Once the new outline has been completed, the original window is 'mapped' onto the new one, being re-scaled as necessary to fit correctly. Note that there may be some loss of fine detail when re-scaling windows due to the resolution of the screen. In addition, in extreme cases there may be some loss or corruption of colour information if the limit of four colours per character cell is exceeded when reducing windows.

A number of other operations allow windows to be 'flipped', or mirrored in the direction specified, or rotated clockwise either one quarter, one half or three quarters of a turn about their centre point.

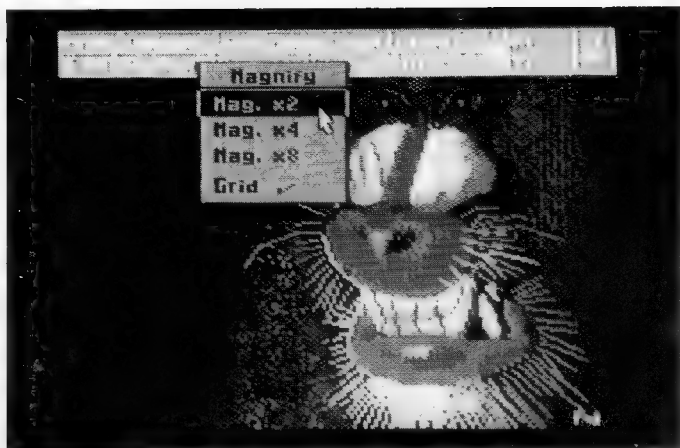
Two further options on the menu may be used to put a window definition on the screen - 'Last window' retrieves the previously defined window and re-draws it to allow further operations to be carried out, while 'Whole screen' creates a window definition that takes up the entire picture. The latter may be useful to reduce the size of an entire picture using 'Clear and re-scale'.

To make multiple copies of a window, the 'Multiple' switch at the bottom of the menu may be turned on. This switch also applies to the re-scale commands.

The Files menu may be called from here to save windows to and load them from disc. The menu operates in the same way as for picture files, font files and so on. The Save option writes the contents of the current window to the disc, requesting a filename in the process, while the Load option is used to retrieve a previously saved window. In the latter case, a filename is chosen from the directory and the 'Load' option selected. The menus will disappear and a new window outline will be drawn on the screen, equal in size to the window saved on the disc, which will move around on the screen with the cursor until select is pressed. When this is done, the contents of the window is loaded in from the disc and drawn at the current position, with the usual references being made to the colour exclusion and priority lists (note, however, that the paper colour in the disc window is automatically excluded when it is retrieved). If the Multiple switch is on, the outline is redrawn afterwards so that another copy of the filed window may be drawn. Window files may be deleted and renamed in the same way as those containing pictures, fonts, patterns and program setups.

Finally, the Colours menu may be invoked from the Windows menu using the last option.

MAGNIFY



ADVANCED ART STUDIO allows areas of the screen to be magnified for detailed examination and alteration on a pixel basis. Three levels of enlargement are provided, with the ability to edit pixels in the picture and pan and zoom in each level.

To magnify a section of the screen, pull down the Magnify menu and select one of the three options at the top of the menu. The menu will disappear and the cursor will change to a representation of a magnifying glass. Move this cursor around until the centre of the glass is above the portion to be enlarged, and press select.

The main screen will then be replaced by a magnified portion of your picture together with a number of options and commands. When the cursor is positioned inside the enlarged view of the picture, its shape is changed from the arrow into a cross-hair, and the coordinates of the pixel inside the picture are displayed in the box at the top of the screen.

At the top left corner of the menu, three boxes are provided to indicate and change the current screen magnification, its present value being shown by a tick in the appropriate box. To select a new scaling while inside the magnify display, simply click the desired value and the screen will zoom in or out to apply the new magnification, keeping the centre point where possible.

Moving the display around the screen is done using the four arrowed boxes to pan the magnified section in the direction indicated. In addition, the 'home' symbol will place the magnified section at the top left corner of the picture. The highlighted sections in between the two vertical and the two horizontal arrows indicate the section of the picture that is currently on display.



A grid may be superimposed over the enlarged display in x4 and x8 modes, and may be turned off either by the 'Grid' switch in the Magnify menu when pulled down from the main menu bar, or using the 'Grid' switch at the top of the enlarged picture display.

While the enlarged view of the picture is on the screen, individual pixels may be changed by moving the cross-hair cursor over them and pressing select. The exact way in which the pixels are operated upon depends on the option currently selected. They can either be 'Cleared', where they are set to the paper colour, 'Plotted', where they are set to a specific colour, or 'Cycled',

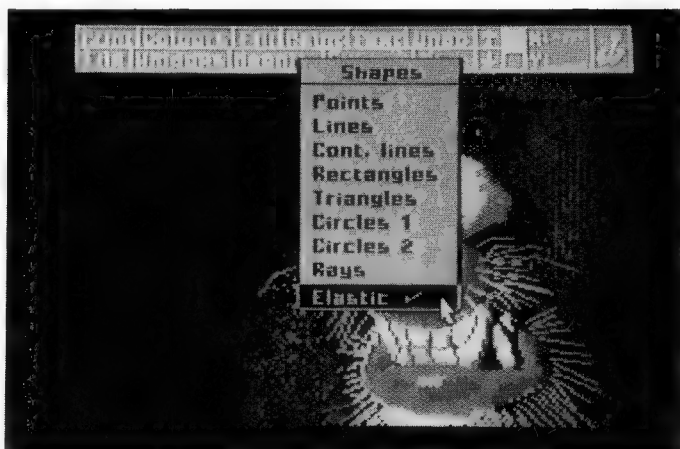
where they are given each of the four colours currently allocated to their cell, one at a time. This last option is most suited to 'touching up' the details of a picture in the final stages, as it will not disturb the contents of the colour memories. The operation currently selected is indicated either by a tick in the boxes marked 'Clear' or 'Cycle', or by a rectangular coloured box of the current plotting colour in the box marked 'Plot'. To change the mode, click on the box required - in the case of the 'Plot' selection, a sub-menu will be drawn to allow the plotting colour to be selected from the full palette of 16 colours

The final two options in the enlarged magnify display allow the screen to be returned to the view of the picture at normal size (using the 'Exit' option) and also permit a temporary view of the whole picture at normal size (using the 'View' option) to check on the progress of the touch-up operations. This latter option displays the whole picture as long as select is held, returning the display to the same magnified area as soon as it is released.

The operation of the plotting process depends on the ink colours already present in the current cell. If the desired colour is not available, then the least frequent colour in the cell is replaced by the new one and the pixels previously displayed in it are changed to the picture paper colour. If the colour is present, the pixel is simply changed to it using a cycle operation. Note that the colour exclusion and priority lists do not apply in Magnify mode.



SHAPES



The commands on this menu are used to draw various shapes on the screen. Seven different command routines are provided, namely single points, lines, a continuous line, rectangles, triangles, circles and rays.

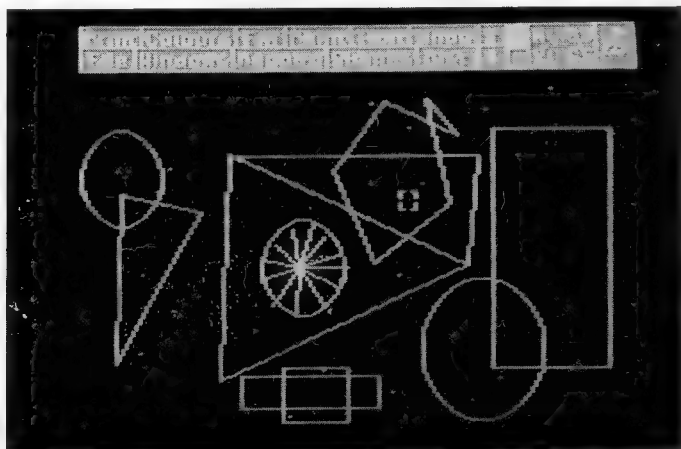
Each shape is made up from straight line segments of a single pixel width. Shapes are drawn by moving the cursor around the screen and pressing select to define their vertices. The outlines of the shapes are always drawn in the current Ink colour as defined in the Colours menu, with reference to the colour priority list to allow lines of objects to be drawn 'behind' existing objects.

For example, to draw a triangle, pull down the Shapes menu and click on the 'Triangles' option. Move the cursor about the screen, pressing select to define the points of the triangle one by one. Once the outline has been drawn another one can be defined in the same way.

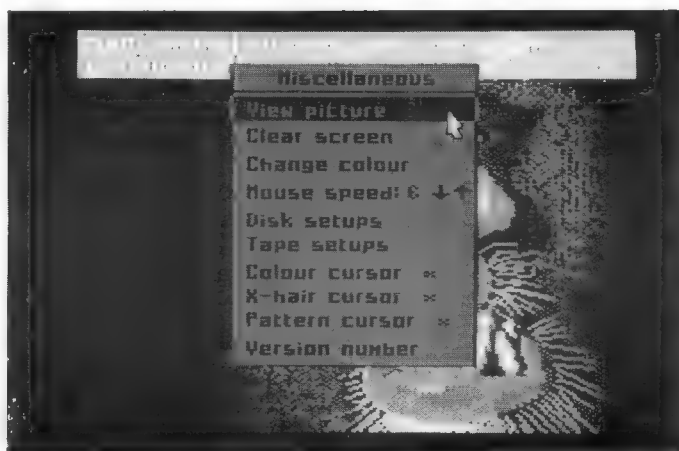
A circle may be drawn in two different ways - by selecting the 'Circles 1' option, the centre point of the circle is defined first and a point is then set on the circumference. Choosing the 'Circles 2' option allows the points to be defined in the reverse order.

Shapes can be drawn 'elastically' by turning on the 'Elastic' switch at the bottom of the menu. An elastic shape moves across the screen with the cursor as soon as the first point has been defined, expanding and contracting as required. This feature helps to align a shape correctly before committing its final position and drawing the outline properly by pressing

select. Note that no changes are made to the actual picture until the shape is finalised.



MISCELLANEOUS



This menu collects together a number of options and commands that do not apply to any particular operation. The first option allows the whole of your picture to be displayed on the screen without the main menu bar. Pressing select again returns to the normal menu display.

The second option can be used to clear the whole screen, setting all pixels to the paper colour regardless of the settings for the exclusion and priority lists. The Undo option can be used to restore the old contents immediately afterwards.

The 'Change colour' option provides an easy method of swapping colours over all or part of the picture. It is only available if a window has been defined and its selection causes two sub-menus to be drawn, one after the other, to ask you for two colours, a source and a destination. Once the destination colour has been given, the option will convert all occurrences of the source colour within the window to the destination colour.

The 'Mouse speed' option allows the speed of cursor movement in relation to mouse movement to be adjusted to suit different types of mice and personal preferences. The current speed is displayed next to the option, 1 being the slowest. The up and down arrows may be used to vary the setting in the usual way.

The next two options allow you to save all of the program setup information, i.e. the states of all of the switches, scaling factors, colours, priority and exclusion lists and so on to cassette or disc, and load these settings back again at a later date. The 'Disc setups' option invokes the disc menu

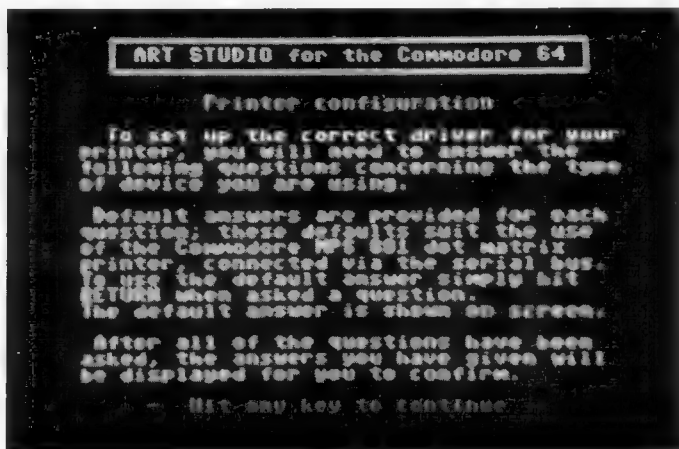
described in the FILES section to save and retrieve disc files containing setup information, and the 'Cassette setups' option does the same for the Cassette files menu. When you load the disc version of ADVANCED ART STUDIO, it will search the disc for a setups file with the name 'default', and load it if it is found. This allows you to customize your copy to ensure that your favourite settings are always loaded immediately. (Note that the disc version of ADVANCED ART STUDIO will also perform the same process for the character font file and the user-defined pattern file with the same name, allowing all of the most commonly used settings, patterns and characters to be loaded and made ready for instant use.)

The next three options on the Miscellaneous menu allow the way in which the cursor is displayed to be changed according to the current mode of operation. The 'Colour cursor' option causes the icons such as the roller, brush and pen to be coloured to match the current Ink colour as a reminder of its setting. The 'X-hair cursor' switch causes most icons and cursor shapes to be shown as a cross-hair like the one in the magnified view of the screen. This assists in precisely aligning objects, vertices of shapes, etc. Finally, the 'Pattern cursor' option makes the cursors in brush, patterned fill and pen mode represent the actual shape they will be adding when select is pressed, again assisting in the exact alignment of these objects.



The final option in the menu displays a copyright notice and the release number of the particular version of ADVANCED ART STUDIO that you are using.

APPENDIX 1 - CONFIGURING THE CASSETTE



The cassette supplied is a master cassette whose function is to produce a personalised copy of ADVANCED ART STUDIO, in the sense that it is configured for the machine you are using. This is necessary to avoid having to enter a number of details every time you wish to use the program - a configuration process is supplied which you need use only once to produce a working ADVANCED ART STUDIO program cassette. Note that the cassette supplied may not be used directly to run ADVANCED ART STUDIO (side 1 contains the Art Studio master, and side 2 contains some sample pictures).

To perform the configuration process, you will need a blank cassette and the program master cassette. Insert the master into your cassette deck, make sure it is rewound, and press SHIFT and RUN/STOP to load and run the configuration program.

The program will then ask you questions about your printer in order to perform the configuration process. The first question asks whether your printer is connected via the Commodore's serial bus (for Commodore printers and certain interfaces) or by the built-in Centronics interface. (Epson and other Centronics printers). If your printer uses the serial bus, the program asks you which device number the printer will respond to - for example, the MPS 801 may be device 4 or 5 depending on the position of the switch on its rear panel - consult your printer manual for details.

The program asks how many wires on the print head are used in bit image mode, if the number of rows of dots are printed on each pass of the head. The most common answer to this is 8, however, the MPS 801 and certain

others use 7 wires only. Note that the number of wires used in bit image is not always the same as the number of wires in the print head - again, you should check your manual for details. The program also needs to know whether the top wire is controlled by the most significant bit of the data bytes sent to it or the least significant - for most printers, it is the most significant.

The program then asks whether the unused bit of the data bytes sent to the printer should be set or reset - this question is only asked if you are using 7 wires in the print head, and determines the state of the remaining bit in the data. For the MPS 801, the eighth bit should be set to identify the byte as bit image data, but for most others it should be reset.

The next information requested by the program concerns the way in which the printer is set up at the start of a screen dump. ADVANCED ART STUDIO sets the printer up by sending eight bytes of data to the printer, and you must tell the configuration program which bytes to send. The MPS 801 does not require any set up, however most others need to be told what line spacing to use. For example, an Epson MX-80, with 8 dots, or 8/72" requires the codes **27, 65, 8**. Consult your printer manual for details of other codes that may be specified at the start of a dump.

Special control codes are needed by printers to switch from their normal text mode to graphics mode. In addition, most dot matrix printers can operate in two different graphics modes, known as single density and double density. The resolution in the latter mode is generally greater than that in the former, i.e. more dots can be printed across the page. Different control codes are needed for the two modes. ADVANCED ART STUDIO asks how many dots your printer expects in single density, and the control codes to select that mode, and then it asks for the same information for double density mode. If your printer has only one graphics mode, then enter **0** for the dots in double density. Again you can enter up to 8 control codes, separated by commas. Note that you can enter double byte parameters directly. For example, the responses for an Epson MX-80 printer would be 480 dots in single density, for which the control codes to select single density mode are **27,75,480**.

When the dump is completed, a further string of bytes is sent to the printer - you can use this string to scroll the paper up if you wish, or to reset the printer line spacing or other functions. If you do not wish to use this feature, simply hit RETURN.

Finally, the program asks you to enter the codes for a line feed and for a carriage return. Your printer may not require the line feed, since many printers generate this code automatically when they receive a carriage return - on other printers there is a switch which determines whether the line feed is inserted or not. If your printer does not require the line, enter the null code for the line feed character (normally **0**). The normal values are **13** for carriage return and **10** for line feed.

The program then asks you whether you are happy with the parameters you have entered, displaying them on the screen to aid confirmation. If you are satisfied with these, enter 'Y' and the configuration will continue, if you are not, entering anything other than 'Y' will cause the questions to be repeated.

The program then loads the remaining sections of code from the master cassette and produces the working version of the program in the machine's memory. Once this has been done (it takes a few minutes to load), a message appears requesting you to remove the master cassette and insert the blank cassette on which you wish to record your personal copy. Do this, and when you have made sure that the cassette is fully rewound and ready, enter 'Y'. The program then produces your working version, which should be used in future by using the SHIFT and RUN/STOP keys together, or by typing **LOAD "" <RETURN>**.



APPENDIX 2 - CONFIGURING THE DISC

When you run ADVANCED ART STUDIO from a disc, the program will search the volume for a file containing a description of, and routines for handling, the printer that you are using. When ADVANCED ART STUDIO is supplied, a file is included on the disc that supports the MPS 801 printer, and if this is the one you are using then there is no need to perform any program configuration at all.

However, if your printer is of a different type, or you wish to change the configuration at a later stage, it will be necessary to use the printer configuration program also supplied on the disc. This program produces the file which is loaded when ADVANCED ART STUDIO is run from disc, and is used separately from the main program by issuing the two BASIC commands:

```
LOAD "STUDIOCONFIG", 8 <RETURN>
```

```
RUN <RETURN>
```

The configuration program now displays all the parameters on the screen, and asks you if they are correct. If you enter anything other than 'Y' then you will be asked to re-enter the parameters. If you are happy with what you have typed in, enter 'Y' and the configuration program will write these parameters to the disc. The next time you load ADVANCED ART STUDIO, these new parameters will be used by your printer when dumping the screen.

To run the disc version of Art Studio, type:

```
LOAD "*",8,1 <RETURN>
```

APPENDIX 3 - BASIC SCREENLOADER

The ADVANCED ART STUDIO disc and the first file on the B-side of the cassette contain a BASIC program to enable you to load pictures created on the ADVANCED ART STUDIO in Multicolour mode back onto the screen so that they can be easily displayed, or used as loading screens for your own programs.

The cassetteversion is loaded using the commands

```
LOAD"MULTILOADER" <RETURN>  
RUN <RETURN>
```

The disc version is loaded using

```
LOAD"MULTILOADER",8 <RETURN>  
RUN <RETURN>
```

By listing the program you will be able to modify it so that it loads your own programs after displaying the picture.

GLOSSARY

English	Deutsch	Français
A		
arrow boxes	Pfeilkästchen	cases fléchées
B		
background	Hintergrund	fond
back-up store	Zusatzspeicher	copie de sauvegarde
binary	binär	binaire
bold	fett	gras
bold print	Fettdruck	impression en gras
border	Rand, Grenze; angrenzen	bord, bordure, avoisiner
boundary	Grenzlinie	limite
brushes	Pinzel	pinceaux
C		
caps.lock	Großdruck einstellen	mettre en capitales
catalogue	Verzeichnis	catalogue
centre	Mittelpunkt/Zentrum	centrer, centre
change colour	Farbe wechseln	changer la couleur
circles	Kreise	cercles
circumference	Peripherie	circonférence
clear	löschen	effacer, supprimer
clear character(s)	Zeichen löschen	effacer un caractère(s)
clear screen	Bildschirm löschen	effacer un écran
clear window	Fenster löschen	effacer une fenêtre
clicking	Einklicken; durch Knopfdrücken aktivieren	cliquer, valider
colour palette	Farbpalette	palette de couleurs
colours	Farben	couleurs
control codes	Kontroll-Codes	codes de contrôle
co-ordinates	koordinieren	coordonnées
copy ROM	kopieren ROM	copier ROM
cross-hair	Fadenkreuz	en forme de croix
cursor	Cursor, Positionszeichen	curseur
cut and paste	ausschneiden und einkleben bzw. inserieren, einfügen	couper et coller
D		
define window	Fenster festlegen, definieren	définir une fenêtre
diameter	Durchmesser	diamètre
discs	Disketten	disquettes
dot matrix printer	Punktmatrixdrucker	imprimante matricielle à points
double density	doppelte Dichte	intensité double
dump screen	drucke Bildschirm	vidage de mémoire de l'écran

E

edit
edit brush
edit texture

editieren
Pinsel editieren
Textur, Struktur editieren

éditer
éditer un pinceau
éditer une texture, une
structure
élastique
effacer, gommer
gommes
exclure des encres

elastic
erase
erasers
exclude inks

elastisch
löschen, streichen
Löcher
Farben ausschließen

F

files
fill
fill, solid

Dateien
füllen, an-, auf-, ausfüllen
einfarbiges füllen

fichiers
remplir
remplir d'une couleur
unie
remplir d'une texture
basculer un caractère
basculer une fenêtre
caractère(s), jeu de
caractères
au premier- plan

fill, textured
flip character(s)
flip window
font

texturiertes füllen
Zeichen wenden, umdrehen
Fenster wenden, umdrehen
Font, Schrift (-art, -form)

foreground

Vordergrund

G

grey-scale

Graufarbtton-Skala

échelle de dégradés
gris
grille
verrouillage de grille

grid
grid-lock

Raster
Raster-Verschuß

H

hard copy
hexadecimal
highlight

ausgedruckte Kopie
hexadezimal
hervorheben

copie en clair ; support
héxadécimale
mettre en valeur

I

icons

Steuer-, Vorrichtungssymbole
bzw. -zeichen

icônes

ink
input devices
inverse
invert character(s)
invert window

Druck, Tinte
Eingabeeinheit
invertieren, invertiert
Zeichen invertieren
Fenster invertieren

encre
dispositifs d'entrée
inverse
inverser les caractères
inverser un fenêtre

J

justify

Rand ausgleichen

justifier, aligner (des
lignes, par ex.)

K

keyboard

Tastatur

clavier

L

last window	letztes Fenster	dernière fenêtre
linefeed	Zeilenvorschub	interligne
lines	Linien, Zeilen	lignes
load file	Datei laden	charger un fichier
logical colour	logische Farbe	couleur "logique"

M

magnifying glass	Lupe	loupe
menu bar	Menü-Balken bzw. -streifen	barre de menu
merge	miteinander verbinden, mischen	fusionner
merge file	Dateien miteinander verbinden bzw. mischen	fusionner des fichiers
merge window	Fenster miteinander verbinden	fusionner des fenêtres
miscellaneous	vielseitig	divers
mode	Modus	mode
mouse	Maus-Steuervorrichtung	souris
multiple	mehrfach	multiple
multiply	vervielfältigen, multiplizieren	multiplier

N

null brush	Null-Pinsel	pinceau nul
null texture	Nulltextur	texture nulle

O

over, overwrite	überstempeln, überschreiben	recouvrir, écrire par recouvrement
-----------------	-----------------------------	------------------------------------

P

paint roller	Farbroller	rouleau à peinture
pan	richten (auf), zielen	panoramique
paper	Papier	papier
parameter file	Parameter-File	fichier de paramètres
patterns	Muster	modèles
pens	Stifte	stylos
physical colours	physikalische Farben	couleurs "physiques"
points	Punkte	points
printers	Drucker	imprimantes
protect inks	Farben sichern	protéger des encres
pseudo-inks	Pseudofarben	pseudo-encres, fausses encres
pull-down menus	'raus ('runter-) ziehbare Menüs	menus déroulants
punctuation	Punktion	punctuation

R

rays	Strahlen	rayons
rectangles	Rechtecke	rectangles
re-scale window	Fenstergröße neu festsetzen	rééchelonner une fenêtre
rotate character(s)	Zeichen rotieren	faire pivoter un caractère(s)
rotate window	Fenster rotieren	faire pivoter une fenêtre

S

save file	Datei (ab)speichern	sauvegarder un fichier
screen mode	Bildschirm-Modus	mode écran
scroll	durchlaufen (lassen), nach oben (unten, rechts, links) verschieben, durchrollen	faire défiler, vers le haut, le bas, vers la gauche, la droite
scroll catalogue	Verzeichnis durchlaufen lassen	défiler un faire catalogue
scroll character(s)	Zeichen rollen, durchlaufen lassen	faire défiler caractère(s)
scroll font	Font durchlaufen lassen	faire défiler l'écran
scroll screen sideways	Bildschirm durchlaufen lassen seitlich	sélectionner une touche oblique, de côté
single density snap	einfache Dichte schnelles Einfügen, Aufsetzen	densité simple claquement, claquer, casser net
solid fill	festes Füllmuster	remplissage uni
spray cans	Sprühdose	aérosols
stipple	punktieren	pointillés
swap inks	Farben tauschen	échanger des encres
switches	Schalter	interrupteurs

T

tesselated	Mosaikboden	en mozaïque
texture	Textur, Struktur; texturieren	texture, structure
triangles	Dreiecke	triangles

U

undo	ungültig bzw. rückgängig machen	défaire
user-defined graphics	durch den Benutzer festgelegte Graphiken	graphismes redéfinis oblique, de côté

V

version number	Ausgabe-Nummer	numéro de version
view screen	Bildschirm einsehen	visualiser la page écran

W

wash

mit einer Farbe "tünchen"
bzw. kolorieren
"Tünch"-Textur

badigeonner avec une
couleur

wash texture

badigeonner une
texture
fenêtres

windows

Fenster

Z

zoom

zoomen, annähern

faire un zoom
rapprocher

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34,35



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